Merge1 Background notes (readme file)

The Forest and Fish Report, adopted by the Legislature in May of 1999 (ESHB 2091), outlined a plan to institute a new habitat-based water typing system on the state's official hydrographic map. The report delineates the waters of the state into three categories: type S waters (Shorelines of the State (Shorelines Management Act), type F waters (fish habitat) and type N (non-fish habitat). The report stated that the new water type system "will be based on a multi-parameter, field verified geographic information system (GIS) logistic regression model. The multi-parameter model will be habitat-driven and will use geomorphic parameters such as basin size, gradient, elevation and other indicators." [See: Forests and Fish Report. "Appendix B - Riparian Strategies", p. 18.] The modeling decision was based on prior work performed by industry scientists and statisticians. The plan for the new water typing system was incorporated into the Forest Practices Rules and Board Manual of July 1, 2001.

The water typing model is based on thousands of field surveys of fish presence and fish habitat (dependent model variable). Additional independent model parameters are average downstream gradient, elevation and basin size derived from the US Geological Survey's digital elevation model (DEM) for the state, and average annual precipitation. Technical considerations required that the model be developed on a "virtual" stream network system also derived from the DEM database. The DEM-based model results were then transferred to the DNR's hydrographic GIS map (HYDRO) in order to implement the new water types. Concurrent with the lengthy modeling process, the DNR has had to reformat HYDRO into a new data structure to accommodate the model implementation.

This preview release of the DNR's habitat-based water typing system on the new HYDRO data model provides the DNR's Forest Practices stakeholders a first look at the results of the modeling process. Because of spatial differences in certain areas between the "virtual" modeled DEM hydrographic layer and the DNR's, there are a number of streams in HYDRO where the model results could not transferred (or only partially transferred). For those unmatched, Unmodeled streams, the DNR has "cross-walked" the current type (fp_wtrty_1975_cd) to the new water type (see **fp_wtrty_cd** and **fp_wrty_desc**_txt fields). The DNR is also including a water type explanation code and descriptive text for every stream segment (see **fp_mdlexp_cd** and **fp_mdlexp_desc_txt**). For each stream segment in the GIS, the stakeholder will be able to determine the current ('75) water type, the habitat-based water type and how that new water type was derived (e.g. based on model, based on "'75" water type, etc.).

There are certain hydrography features that are not included in the modeling process. For type S streams, we have used the official "Shorelines of the State" GIS information from the Washington State Dept. of Ecology. Water bodies are not included in the modeling process. We used the Forest Practices Rules for coding lakes, ponds and impoundments. Wet areas in the hydrography polygon layer (wbws) are also not typed in the new system. Also be aware that we are not including the complete list of attributes on the HYDRO layer for this preview version that will be available when the final, accepted data model is published. We are only including attributes for identification purposes and those pertaining to the modeling and typing processes.

The newly reformatted HYDRO layer and modeled water typing system have been four-plus years in the making. Meanwhile, the original Hydro layer is still in use and constantly updated with new information derived from approved water type change forms, while the '75 water type codes carried on the reformatted HYDRO were "frozen" sometime in 2000. Because stakeholders' have requested that the DNR provide the current water types as well as the new typing system on the hydrographic map, we have attempted to update the preview copy of the new HYDRO layer with changes approved up to the end of 2003. Please be aware that we have been unable to process all of the changes that have been made through this period of time and that this copy of the HYDRO layer is somewhat incomplete. We are still going through the change

forms for additional corrections and additions. It has not gone though a complete and thorough technical quality assessment as of yet. A number of additional fields in the digital data have yet to be corrected for stream changes or populated for new streams (not shown in the preview session). We still need to perform a few adjustments to the new habitat-based water types, mostly involving lateral, non-fish habitat tributaries. However, we are satisfied the modeled water types are as precise as we can get to the virtual modeled stream network and that all the water type codes are accurate to the best of our ability.